

CLAIMS - We claim

1. A semiconductor workpiece holder for use in a semiconductor electroplating apparatus used to plate a metal or metals onto a semiconductor workpiece, comprising:

a workpiece support mounted to support a semiconductor workpiece in position with at least a processed surface of the workpiece being in contact with a plating bath;

at least one electrode finger which is electrically conductive and capable of receiving and conducting electrical current supplied thereto;

said at least one electrode finger having a contact face forming part thereof which is adapted to engage a surface of the semiconductor workpiece to conduct electrical current between therebetween;

wherein said contact face is pre-conditioned by plating onto said contact face a contact face plating layer made from a metal-containing contact face plating material which is similar to a workpiece plating material which is to be plated onto the semiconductor workpiece.

2. A semiconductor workpiece holder according to claim 1 wherein said contact face plating layer is at least 0.1 microns in thickness.

3. A semiconductor workpiece holder according to claim 1 wherein said contact face plating layer is formed by electroplating said contact face plating material onto the contact face.

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SUB #1

1 4. A semiconductor workpiece holder according to claim 1
2 wherein said contact face plating layer is formed from said workpiece
3 plating material.

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5 5. A semiconductor workpiece holder for use in a
6 semiconductor electroplating apparatus used to plate a metal or metals
7 onto a semiconductor workpiece, comprising:

8 a workpiece support mounted to support a semiconductor
9 workpiece in position with at least a processed surface of the workpiece
10 being in contact with a plating bath;

11 at least one electrode finger which is electrically conductive and
12 capable of receiving and conducting electrical current supplied thereto;

13 said at least one electrode finger having means forming a contact
14 face layer forming at least part of said at least one electrode finger
15 which is adapted to engage a surface of the semiconductor workpiece
16 to conduct electrical current between therebetween;

17 wherein said means forming a contact face layer is made from a
18 metal-containing contact face material which is similar to a workpiece
19 plating material which is to be plated onto the semiconductor workpiece.

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21 6. A semiconductor workpiece holder according to claim 5
22 wherein said means forming a contact face layer is at least 0.1 microns
23 in thickness.
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Sub A Cont 7

1 7. A semiconductor workpiece holder according to claim 5
2 wherein said means forming a contact face layer is formed by
3 electroplating said contact face material onto the contact face.

4
5 8. A semiconductor workpiece holder according to claim 5
6 wherein said contact face material is formed from said workpiece plating
7 material.

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9 9. A semiconductor workpiece holder for use in a
10 semiconductor electroplating apparatus used to plate copper onto a
11 semiconductor workpiece, comprising:

12 a workpiece support mounted to support a semiconductor
13 workpiece in position with at least a processed surface of the workpiece
14 being in contact with a plating bath;

15 at least one electrode finger which is electrically conductive and
16 capable of receiving and conducting electrical current supplied thereto;

17 said at least one electrode finger having a contact face forming
18 part thereof which is adapted to engage a surface of the semiconductor
19 workpiece to conduct electrical current between therebetween;

20 wherein said contact face is pre-conditioned by plating onto said
21 contact face a contact face plating layer made from a copper-containing
22 contact face plating material which is similar to a copper workpiece
23 plating material which is to be plated onto the semiconductor workpiece.
24

1 10. A semiconductor workpiece holder according to claim 9
2 wherein said contact face plating layer is at least 0.1 microns in
3 thickness.

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5 11. A semiconductor workpiece holder according to claim 9
6 wherein said contact face plating layer is formed by electroplating said
7 contact face plating material onto the contact face.

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9 12. A semiconductor workpiece holder according to claim 9
10 wherein said contact face plating layer is formed from said workpiece
11 plating material.

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Sub A-cont. 7

1 13. A method for plating metals onto the surface of a
2 semiconductor workpiece, comprising:

3 contacting a surface of the semiconductor workpiece with an
4 electrode at a contact face forming a part of the electrode, said contact
5 face being covered by a contact face plating layer, said contact face
6 plating layer being formed from a contact face plating material;

7 submersing a processed surface of the semiconductor article into
8 a plating bath which is used to plate a workpiece plating material onto
9 the semiconductor workpiece;

10 electroplating workpiece plating material onto the semiconductor
11 workpiece by passing electrical current between the semiconductor
12 workpiece and the electrode, said electrical current passing through the
13 contact face plating layer.

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15 14. A method according to claim 13 wherein said contact face
16 plating layer is formed from said workpiece plating material.

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18 ~~15.~~ A method according to claim 13 wherein said contact face
19 plating layer is formed from said workpiece plating material.

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Sub A2

1 16. A method for plating copper onto the surface of a
2 semiconductor workpiece, comprising:

3 contacting a surface of the semiconductor workpiece with an
4 electrode at a contact face forming a part of the electrode, said contact
5 face being covered by a contact face plating layer, said contact face
6 plating layer being formed from a copper-containing contact face plating
7 material;

8 submersing a processed surface of the semiconductor article into
9 a plating bath which is used to plate a workpiece plating material onto
10 the semiconductor workpiece;

11 electroplating workpiece plating material onto the semiconductor
12 workpiece by passing electrical current between the semiconductor
13 workpiece and the electrode, said electrical current passing through the
14 contact face plating layer.

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16 17. A method according to claim 16 wherein said contact face
17 plating layer is formed from said workpiece plating material.

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19 ~~18. A method according to claim 16 wherein said contact face~~
20 ~~plating layer is formed from said workpiece plating material.~~